opportunity for asserting itself—now divining the explanation of some puzzle, now losing itself in fanciful flights. Among his other papers of this category, I may mention, as more widely known, "Können aus Bastarden Arten werden?" and "Parthenogenesis einer angiospermen Pflanze" (1876). The latter referred to *Antennaria alpina*, and the correctness of the construction he put on the facts observed has been doubted for a long time; but a paper by Dr. Juel, of Upsala, published just a week previous to Kerner's death, must have given him great satisfaction if it reached him, as the author confirmed fully the disputed points by independent observation and careful microscopical investigation. Among his papers concerning systematic botany may be mentioned one under the title, "Abhängigkeit der Pflanzengestalt von Klima und Boden" (1868), which contains a valuable and highly philosophical essay on the section Tubocytisus of Cytisus; further, his "Monographia Pulmonariarum" (1878), and a very great number of critical notes, which are scattered through his "Vegetations-Verhältnisse des mittleren und östlichen Ungarns und angrenzenden Siebenbürgens" which, began in 1867, run through thirteen volumes of the *Oesterreichische Botanische Zeitschrift*, however, without having been completed. Numerous similar notes are also contained in the "Schedae ad Floram Exsiccatam Austro-Hungaricam," a beautifully prepared collection of Austrian and Hungarian plants, the issue of which proceeded to Century xxii. In his investigations into subjects of systematic botany, Kerner hardly ever ventured beyond the boundaries of his special domain, *i.e.* Austria-Hungary and the adjoining districts. This, perhaps, was partly the cause of his strong tendency towards "Jordanism," or the excessive subdivision into species, of his occasional one-sidedness, such as is often found in strictly local botanists, and of the almost complete absence of any attempt at dealing with groups of a higher order and from a broad standpoint. The only time he tried a problem of this category, namely in the chapter on the "Stämme des Pflanzenreiches," or the phyla of the vegetable kingdom, in his "Pflanzenleben," he was rather unfortunate, and he wisely omitted it in the second edition.

His great work, "Pflanzenleben," well known to the English public from the translation by Prof. F. W. Oliver ("The Natural History of Plants") was in many respects the crowning result of his life-long labours. When he undertook to write the book, which was to be one of a series of popular treatises on natural history, published by the Bibliographische Institut of Leipzig, his plan was to incorporate all his own experiences and observations, many of which were only laid down in rough notes, to assimilate those of other authors, and to produce a standard work which would treat homogeneously all the various phases of plant-life. It was a tremendous task, and must have heavily taxed his constitution, which was not over-strong, although he was scarcely yet past the prime of life when he commenced it. The work is known for its lucid, nearly always fascinating and often classic style, its beautiful illustrations, few of which are not original, its fulness of suggestive matter, its occasional quaint mixture of truth and fiction—of course, unconscious fiction—and its independent conception, and little need be said about it in this place. It is the very embodiment of the genius of its author, and it reflects equally well his strong and his weak points. Measured by it, Kerner might appropriately be called the poet-botanist.

Kerner was an excellent lecturer, who raised the subject of his lecture high above the ordinary level by enlivening the purely morphological and otherwise dry details by constant references to the relations which exist between form and function, and also by his bold and highly artistic draughtsmanship. He was a man of refined culture, but naturally nervous; he came not rarely into collision with others, from the effects of which he, no doubt, ultimately suffered most. Many of his smaller papers are so scattered or buried in all but inaccessible periodicals, and even daily papers, that a careful selection and reissue of those amongst them which are really valuable is very desirable.

OTTO STAPF.

NOTES.

THE Cambridge Anthropological Expedition to Torres Straits arrived at Thursday Island on April 22. The Hon. John Douglas, C.M.G., the Government Resident, did all in his power personally and officially to advance the aims of the expedition, as did also the other Government officials and many others. The Hon. C. T. J. Byrnes, Chief Secretary, sent a cordial telegram of welcome and offers of assistance on behalf of the Government. After a week's delay a start was made for Murray Island, and owing to unfavourable weather it took another week to traverse the hundred and twenty miles between the two islands. The Murray Islanders gave Dr. Haddon a very cordial reception; they appear to understand the main objects of the expedition, and many of them are assisting in various ways. A deserted mission-house is occupied as a dwelling, and it has been converted into a temporary anthropological and psychological laboratory, photographic studio, surgery and dispensary. All the members of the expedition are in good health, and work has commenced in earnest.

THE French Société d'Encouragement has awarded the grand prize of 12,000 francs to M. Moissan for his numerous researches in chemistry; the prize of 2000 francs for the experimental study of the properties of metals and alloys to M. C. E. Guillaume; the prize of 1000 francs for an investigation of albuminoids to M. Fleurent; a prize of 2000 francs to M. Cord for his work on the agriculture and geology of the soils in the department of Lozère; an *encouragement* of 500 francs to M. Capredon for his work on metallurgical chemistry; of 500 francs to M. A. Bigot for his work on enamels; of 1000 francs to M. Pagès for his work on the agriculture of the Cantal Department; and 500 francs to M. Mazel for his work on the agriculture of the Vivarais district.

THE Committee appointed in 1895 to examine and report upon the various monographs submitted in competition for the Loubat prizes to be awarded in 1898 have issued their report to President Low, of Columbia University. The monographs that were formally submitted for examination were the productions of eight different authors; of these the committee consider as being the most meritorious, and as most fully complying with the conditions prescribed for the competition, the treatise on "Stone Implements of the Potomac Chesapeake Tide-water Provinces," by Mr. William Henry Holmes, Curator of the Department of Anthropology in the National Museum at Washington, and to this author therefore the committee recommend the awarding of the first prize, value 1000 dollars. In the opinion of the committee the second prize, value 400 dollars, should be given to Dr. Franz Boas, of the Metropolitan Museum of Natural History of New York City, for his monograph entitled "The Social Organisation and Secret Societies of the Kwakiutl Indians." Special mention is also made in the report to a work by Mr. Alfred P. Maudslay, of London, dealing with the archæology of Central America. This work was not submitted for competition, and is not yet in a complete state, but its great merit is such as to be considered worthy of special mention by the committee.

Science states that the New York City Board of Estimates and Apportionment has authorised the reissue of 375,000 dollars in bonds for the construction of buildings for the botanical garden in Bronx Park. Work on the museum building is being carried forward, the contract calling for its completion early next year.

PROF. VON RÖNTGEN has been awarded the Elliot-Cresson medal of the Franklin Institute of Philadelphia.

SIR GEORGE STOKES, Bart., F.R.S., will deliver his presidential address before the Victoria Institute at the annual meeting on Monday, July 18.

As we go to press the annual meeting of the Society of Chemical Industry is being held at Nottingham, under the presidency of Dr. F. Clowes. During the meeting the Society's medal will be presented to Dr. W. H. Perkin, F.R.S.

THE French Botanical Association has elected M. G. Rouy of Asnières as its president for the year. The annual meeting will be held from August 3 to 12, and will be devoted to an exploration of the environs of Gap, Brianson, and du Lauteret.

SIR JOSEPH FAYRER, Bart., K.C.S.I., F.R.S., &c., has been elected a governor of Wellington College.

THE U.S. Commission of Fish and Fisheries has made arrangements for a biological survey of Lake Erie. The work will be under the direction of Prof. Jacob Reighard of the University of Michigan, with whom will be associated Dr. H. B. Ward, of the University of Nebraska, Dr. H. S. Jennings, of the Montana College of Agriculture and Mechanical Arts, Dr. J. Shaw, of Ann Arbor, Mr. A. J. Pieters, of the U.S. Department of Agriculture, and a number of other assistants. Experimental work will be a prominent feature of the survey, and among other problems to be considered are the rate of growth of fishes; the food of young fishes reared from the egg, and the changes in their regimen during growth; the source of food of aquatic rooted plants; the life-histories of food fishes reared in aquaria or ponds, and of certain aquatic insects and other invertebrates; the rate of increase of the plankton as a whole, and of its individual constituents. There will also be systematic studies of the habits, migrations, distribution and food of the fishes and other organisms of the lake. At the beginning of the work Prof. Reighard and Dr. Ward will devote a considerable amount of time to plankton problems, especially the perfection of methods and apparatus; Dr. Snow will carry on experimental work on the algæ; Dr. Jennings will undertake experimental researches on the protozoa, and Mr. Pieters will pursue studies of the aquatic flora. The summer headquarters of the survey will be at the Government hatching station at Put-in-Bay, South Bass Island, Ohio. Lake Erie affords an excellent field for work of this character, on account of its varied fauna, diversified physical features, extensive fishing interests, and the recent serious depletion of the supply of certain valuable food fishes. The investigations, it is stated, may ultimately be extended to some of the other Great Lakes.

THE fourth International Congress of Agriculture will be held at Lausanne from September 12 to 17 next, under the patronage of the Swiss Department of Agriculture. The work of the Congress will be divided into the following sections:—Rural economy, agricultural education, forestry, dairying, stock breeding, agricultural industries, viticulture, protection of birds, insect and other pests. Those who desire to join the Congress as members (subscription 20 francs) are requested to send in their names to M. S. Bieler, Director of the Agricultural Institute, Champ de l'Air, Lausanne, before the 15th instant. Copies of the preliminary programme may be obtained in this country on application to Sir Ernest Clarke, Secretary of the Royal Agricultural Society, at 13 Hanover Square, W.

As has already been announced, the autumn meeting of the Iron and Steel Institute will be held in Stockholm on Friday and Saturday, August 26 and 27. An interesting and varied programme has been prepared by the local committee, and seven papers have been promised, two being by Swedish metallurgists. Mr. Richard Ackerman, Director-General of the Swedish Board of Trade, an honorary member of the Institute, and a Bessemer gold medallist, will read a paper on the development of the Swedish iron industry, whilst Prof. G. Nordenström, of the School of Mines, Stockholm, will submit a communication on the most prominent and characteristic features of Swedish iron ore mining. Mr. C. P. Sandberg will discuss the danger of using rails of too hard a nature, whilst Prof. W. C. Roberts-Austen, C.B., F.R.S., will describe the action of explosives on the tubes of steel guns. The chemical side of metallurgy will be represented by three papers. The first will be by Mr. J. E. Stead, on brittleness in steel produced by annealing; the second by Prof. J. O. Arnold, of University College, Sheffield, on the micro-chemistry of cementation; whilst the subject of the third paper will be the influence of metalloids on cast iron, by Mr. Guy R. Johnson, of Tennessee, U.S.A. An excursion of twenty days' duration will follow the meeting.

AN exhibition of the manufacturing and mineral wealth of the various States and Colonies of South Africa is to be opened at Grahamstown on December 15. It will be divided into five groups or sections dealing respectively with raw materials, manufactures, mining and machinery, natural history and science, and fine arts. The exhibition will remain open until January 21.

IT will be remembered that a few weeks ago Dr. T. E. Thorpe, F.R.S., and Dr. Oliver, of Newcastle-upon-Tyne, were appointed by the Home Secretary to inquire, as experts, into the causes and prevention of lead-poisoning in the Potteries. These two gentlemen have now been invited by the same authority to undertake a similar inquiry into the dangers incidental to lucifer match-making, and have been commissioned to visit some of the factories on the continent.

THE *Electrician* states that the International Submarine Telegraph Memorial Fund has now been closed, and the following amounts have been applied to the objects named: University College, Gower Street, London, to endow the Pender Electrical Laboratory, 5000*l.*; Glasgow and West of Scotland Technical College, to continue annual John Pender Gold Medal, 210*l.*; Glasgow University, to provide annual bursary for student of Glasgow and West of Scotland Technical College who proceeds to Glasgow University, 1650*l.*; marble bust of Sir John Pender, by Mr. E. Onslow Ford, R.A., to be placed temporarily in the Board-room of the Eastern Telegraph Company, and for replica, which has been placed in the reading-room of University College, Gower Street, London, and pedestals for same, 461*l.*

AN electrically-worked underground tubular post for letters and parcels has been designed by Dr. Alfred Brunn and Mr. Viktor Takács, of Budapest, and submitted by them to the Hungarian postal authorities. It has been decided to lay down a trial line from the eastern to the western stations of Budapest, and, if a year's working proves successful, the postal authorities will take over the line, and a scheme for connecting twenty three offices on both sides of the Danube will be carried out.

The doctors of Portugal are evidently very much in earnest about the medical and sanitary well-being of their country, as is shown by the number of resolutions carried by them at the close of the recently held National Congress of Medicine at Lisbon on various subjects which, in their opinion, are of pressing public importance. One resolution called on the Government to give effect to the vote of the Chamber of Deputies, that vaccination should be made compulsory in Portugal. Another series of resolutions had reference to the repression of tuberculosis. The Congress urged that permanent committees should be appointed for the purpose of diffusing a knowledge of the means of prophylaxis against that scourge. It further recommended that all tuberculous patients admitted to general hospitals should be placed in special wards. It was also decided to appoint a committee to study the question of the establishment of sanatoria for the treatment of tuberculosis in Portugal. With regard to leprosy, the Congress called upon the Government to organise a system of careful study of the disease, and regular teaching of the means of dealing with it; to take a census of the population; to establish agricultural colonies of lepers, in connection with each of which there should be places where all the means of combating the disease should be taught; to place legal hindrances in the way of marriages between lepers and the descendants of lepers; and to educate the poor to correct notions as to the hereditary and contagiousness of the disease.

The *Times* of Saturday last contained a report of an address delivered on Thursday before the German Society for Public Hygiene by Prof. Koch on the subject of the plague, in which he dealt especially with his discovery of a plague centre in the Hinterland of German East Africa, whither the disease had been introduced from Uganda. After referring to the plague centres of Hu-nan, Tibet, and the west coast of Arabia, in the vicinity of Mecca, the lecturer went on to lay claim to a fourth centre in Equatorial Africa. It had been found that a devastating disease prevailed at Kissiba, in the extreme north-west corner of German East Africa, close to the Victoria Nyanza. Suspecting that it was the plague, Prof. Koch proceeded from India to East Africa in order to make investigations. With the help of Dr. Zupitza, who made a special expedition to Kissiba, he had been enabled to identify the disease as the bubonic plague. In the case of five persons who had died from the disease anatomical preparations were obtained, and the blood and lymphatic glands of plague-stricken patients were bacteriologically examined. All the ordinary features of the bubonic plague were present. Nine out of ten of those who were infected died. The disease was communicated to rats and to monkeys. It was found that an outbreak of the plague among rats frequently preceded a human epidemic, and, in fact, the rat plague might always be regarded as a warning. A further observation had been made, which was of importance. The inhabitants of Kissiba lived almost entirely on bananas. The banana groves were so thick that they admitted neither light nor air, and were perfect breeding places of the bacillus. It would be most interesting if physiologists could investigate the processes of nourishment and metabolic change which attended an almost exclusive diet of bananas. It had been discovered, however, that Kissiba was not an original plague centre, but that the disease had been introduced from Uganda, as the reports of missionaries who resided there showed. It had existed for a long time in Uganda, but it had recently moved in the direction of Budu. Its introduction to Kissiba had been traced to a native who had visited a friend in Uganda. He returned home and died of the plague, and of a large number of natives who attended his funeral many were infected and perished. It was a favourable circumstance that for the present Kissiba lay somewhat out of the ordinary caravan route.

Dr. Campbell McClure, of Glasgow, describes in the *Deutsche Medicinische Wochenschrift* a bacillus which he discovered while making examinations of milk in the laboratory of Dr. Piorkowski in Berlin. In the agar plate cultures it formed brown granular colonies, which also grew well in glycerine agar at 37° C., presenting a white appearance, confluent in the middle and punctate at the margins, and becoming yellow and slimy in three or four days. Milk treated with the bacillus and kept at 37° C. for 48 hours was coagulated and had a strongly acid reaction and an acetous smell. The appearance of a bouillon culture kept for 24 hours at 37° C. was constant and typical, the fluid being slightly turpid with a considerable flocculent deposit on the bottom and sides of the tube. The bacillus could be stained with the ordinary aniline colours, but not with Gram's solution. Cover-glass preparations stained with methylene blue showed a great similarity to the diphtheria bacillus and the pseudo-diphtheria bacillus of Löffler and von Hofmann respectively.

The current number of the *Lancet* has a note interesting to the vast army of cyclists. After a "spin" along a more or less dusty road the cyclist sometimes experiences a dry and subsequently sore and inflamed throat. Headache and depression often follow, and the symptoms generally simulate poisoning of some kind. When the bacteriology of road dust is considered, these effects are hardly to be wondered at. Hundreds of millions of bacteria, according to the nature of the locality, are found in a gramme weight of dust, and the species isolated have included well-known pathogenic organisms. Indeed, there can be no reason for doubting the infective power of dust when it is known that amongst the microbes encountered in it are the microbes of pus, malignant œdema, tetanus, tubercle, and septicæmia. The mischief to riders as well as to pedestrians would probably be largely averted if, as nature intended, the respirations were rigidly confined to the nasal passages, and the mouth kept comfortably though firmly shut. As investigators have shown, the microbes in the air seldom pass beyond the extreme end of the nasal passage, and consequently never to the larynx or bronchial surfaces. A useful precaution, therefore, in addition to exclusively breathing through the nostrils, would be to douche the nasal cavity, after a dusty run or walk, with a weak and slightly warm solution of some harmless antiseptic.

The Berlin correspondent of the *British Medical Journal* calls attention to the prevalence of trachoma in the eastern provinces of Prussia, where it often assumes an epidemic character, especially among children in the lower schools. The authorities are at last fully alive to the gravity of the matter, and have determined to spare neither pains nor expense in order to stamp out the disease effectually. Thus the city of Königsberg has for the last six months employed ten ophthalmic surgeons especially for the purpose, and the report of their work just published is most satisfactory and hopeful, showing as it does by figures the results already accomplished. In October 1897, of 17,553 school children examined, 5568 were found to be suffering from trachoma; of these, 1763—10 per cent. of those examined—were serious cases. These latter were treated, some in the hospital, some in their own homes, and some in special trachoma classes. By the middle of February the number of cases had gone down to 1218, of which 345 were serious in character. At the date to which the report extends—that is, the end of April—there were only 826 cases, with 223 serious ones. The number of special oculists has therefore been reduced to six.

The Photographic Convention of the United Kingdom was held at Glasgow last week, and we are glad to find, from the report of its proceedings in the *British Journal of Photography*, that so much attention was paid to the scientific side of photography. The President (Mr. John Stuart), in the course of his very interesting opening address, said concerning photography: "It has made the astronomer more than ever master of the heavens. By its aid he has mapped out the starry firmament, and been apprised of the existence of stars the most powerful telescopes had failed to show. In the investigations into the composition of the sun and its corona photography has been an invaluable agent. In the registration of storms in the body of the sun it plays a very important part. In the registration also of the barometric and thermometric variations it is in daily use. . . . Its utility in microscopic work has been abundantly proved of late; bacterial science has made rapid strides by its assistance, and every day seems to produce a more startling discovery than the day before. . . . In the medical profession photography promises to become one of the most beneficent agents science has as yet placed at the service of the healing art. The X-rays, or radiography, are now an indispensable adjunct in every well-equipped medical school. A flourishing society has been started to specialise in this hopeful field, and already developments are daily taking place almost beyond our conception." During the meeting a large number of slides illustrative of solar, lunar, and stellar photography, radiography, and slides in colours by various methods were shown, and everything done tended to bring home to those present the almost universal application of photography to art and science.

WE are glad to learn from *Nature Notes* that the Guildford Natural History and Microscopical Society have practically achieved the object of their memorial to the War Office on the making of Wolmer Forest a sanctuary for the preservation of birds, the War Office having adopted the opinion previously expressed by the Commissioner of Woods and Forests, to which reference has already been made in these columns. The forest came under the management of the Aldershot Game Preserving Association in 1895, since which time all birds have been strictly protected; no birds, except game birds, have been allowed to be shot, and hawks, owls, and other birds have been carefully preserved as far as possible. The heronry has gradually increased from one nest a few years ago to about twenty nests now, and nearly fifty young herons flew from the nest in 1897; foxes are also strictly preserved. The Secretary of the Association states, however, that to make the preservation a success a large area round the outskirts of the forest should be included in the scheme for protection, as at present the destruction of birds and animals is still carried out on private land round the forest.

THE Kew Gardens authorities have many problems submitted to them to solve in the course of a year. Many they succeed in unravelling, but occasionally they are baffled. The June number of the *Bulletin* places on record one of the most curious of the tasks brought before the authorities, and one that they have had but little success with. The specimens referred to in the following letter, which was received from Mr. Kenneth Scott, of Cairo, were carefully examined by Dr. D. H. Scott, of the Jodrell Laboratory, who could only conjecture that they were fragments of the paleæ of some grass. "For some time now malingering Egyptian soldiers have been sent in to the Kasr-el-Aini hospital under my care, suffering from extreme œdema and intense inflammatory injection of the conjunctiva of one or both eyes; the *cornea unaffected.* No discharge from the eye. The condition is entirely unlike that which they also produce by putting in the juice of Euphorbia, slaked lime, seed of 'melocheeya' (*? Corchorus olitorius*) and other things. I obtained the specimens sent you by covering the eye with a thick collodion dressing so as to completely seal it up. The man at the end of five days had evidently feared the inflammation might subside, and therefore raised the dressing and renewed the baneful application, part of which I found on the face of the dressing lying against the eye. I have been entirely unsuccessful in obtaining here any information on the matter, nor have I been able to obtain further quantities of the leaf. The patient either began to fear the consequences of the affair, or his stock of the drug became exhausted, as he in no way interfered with the next collodion dressing which was applied, the eye being quite cured, and the dressing intact after a period of five days."

MR. J. BURTT DAVY has recently presented to the Kew Museum the ingredients of a Chinese prescription purchased by him at China Town, San Francisco, particulars of which, as far as their identification can be made out, may be of interest. The ingredients include fruit-heads of an *Eriocaulon*, apparently *E. cantoniense.* This plant has a reputation in China for various diseases, such as ophthalmia, especially in children, as a styptic in nose-bleeding, and in affections of the kidney. Spiny hooks from the stems of the Gambier plant (*Uncaria gambier*, Roxb.), which have astringent properties, and are mostly used in infantile complaints. Some very thin transverse sections of the stem of *Akebia quinata*, a climbing berberiadaceous plant, also occur in small quantities, as well as the bark of *Eucommia ulmoides* known as the "Tu Chung." Tonic and invigorating properties are ascribed to the latter, and its cost is therefore considerable. Among other ingredients which have not been identified, are crushed flower-heads of a composite plant, and slices of a slender, twig-like stem, probably a willow.

THE *Times* of July 11 states that the sum appropriated by Congress for the service of the United States Department of Agriculture for the fiscal year ending June 30, 1899, shows an increase of 326,300 dollars over that for the fiscal year just ended, the principal additions being for the Weather Bureau and the Bureau of Animal Industry. Under the Weather Bureau provision is made for the establishment of sixteen new stations, and the erection of a small building on the Government reservation at Sault Saint Marie (popularly known as "the Soo").

Engineering has the following interesting note on the most ancient steam engine in existence:—"The oldest engine in the world is in the possession of the Birmingham Canal Navigations, this engine having been constructed by Boulton and Watt in the year 1777. The order is entered in the firm's books in that year as a single-acting beam engine, with chains at each end of a wood beam, and having the steam cylinder 32 inches in diameter with a stroke of 8 feet, and erected at the canal company's pumping station at Rolfe Street, Smethwick. During the present year (1898) this remarkable old engine, which has been regularly at work from the time of its erection to the current year, a period of, say, 120 years, was removed to the canal company's station at Ocker Hill, Tipton, there to be re-erected and preserved as a relic of what can be done by good management when dealing with machinery of undoubted quality. It is worthy of note that the Birmingham Canal Navigations favoured Boulton and Watt in 1777 with the order for this engine, and in 1898, or 120 years afterwards, the company have entrusted the same firm, James Watt and Co., Soho, Smethwick, with the manufacture of two of their modern triple-expansion vertical engines, to be erected at the Walsall pumping station, having 240 horse-power and a pumping capacity of 12,713,600 gallons per day.

ACCORDING to the *Pharmaceutical Journal*, a fresh use for seaweed is claimed to have been discovered by a Norwegian engineer, who exhibited an invention at the Stockholm Exhibition for producing paper-glue, dressing-gum, and soap from seaweed. The first establishment for this branch of manufacture was, according to his statement, to be erected in the district of Stavanger, but, up to the present, nothing appears to have been done in this direction.

The total number of chemical works registered in all parts of Germany, according to the latest trustworthy statistics, is 6144, the total number of persons employed by them being 125,440. Amongst the industries of the Hamburg Consular district which have attained to the greatest importance are those for manufacturing various chemical products, such as nitrates, sulphuric and nitric acid, sulphates, boracic acid, artificial manures, pharmaceutical products, dyeing and tanning extracts, essences, and more particularly different kinds of explosives. The factories in that district now employ altogether some 4000 workmen as compared with about 1300 ten years ago, a fact demonstrating once more the rapid strides made throughout Germany by most branches of chemical industry during recent years.

Bog iron ore is worked in the province of Quebec, Canada, and arrangements are being made (says the *Engineer*) to extract manganese from bog ore deposits in the province of New Brunswick. The ore is a soft, wet stuff, containing 50 per cent. of water, and is covered by a thin coating of vegetable earth. The depth of ore varies from 5 feet to 30 feet. When dried the residuum is a fine black powder, too fine to be treated in the blast-furnace, and this has therefore to be made into briquettes, as is done with the fine dust from blast-furnaces and the finely-divided iron produced from low-grade ores by the Edison electrical process. The cementing material used is kept secret. An analysis of the dried ore at 212° F. is given as follows: metallic manganese, 48·240 per cent.; metallic iron, 5·700 per cent.; sulphur, 0·096 per cent.; phosphorus, trace; silica, 1·88 per cent.

The office of the Bureau of Mines at Toronto has issued a notice to the effect that the first discovery of corundum in Ontario was made late in the year 1896, and exploration work carried on under direction of the Government in 1897 shows that the corundum-bearing lands have an aggregate area of about 50,000 acres. The mineral rights over nearly the whole of this tract are held by the Crown, and they have been withdrawn from sale and lease pending a report on the occurrence of the mineral and the methods of treating it, undertaken by the professors of the Kingston School of Mining. Meantime the attention of prospectors, miners, and capitalists is invited to the district, and, with a view to its development and the establishment of industries in the province for treating and utilising the corundum ore, proposals will be received by the Dominion Commissioner of Crown Lands until the first day of September next.

Prof. Kienitz-Gerloff criticises, in the *Biologisches Centralblatt*, Prof. Plateau's attack on the hypothesis that the bright colour of flowers is the principal agent in attracting insects for the purpose of cross-pollination. He maintains that the facts support the conclusions of Darwin, Müller, and Lubbock much more than those of Plateau, the general results of whose observations he sums up as follows: "The new is not true, and the true is not new."

The U.S. Weather Bureau has published a *Bulletin* (No. 22) on the climate of Cuba, with a note on the weather of Manila. The work has been somewhat hastily compiled by Dr. Phillips, in charge of the section of climatology at the Bureau, and is very useful as showing what information exists, and by giving references as to where it is to be found. There appears to be very little precise meteorological data obtainable for Cuba, excepting for Habana. Observations were begun there by the late Prof. A. Poey, about 1850, and since 1859 have been regularly continued at Belen College. During the ten years 1888–1897 the highest yearly mean temperature was 77°·2, and the lowest 76°·1. The warmest month is July, with an average temperature of 82°·4, and the coldest month is January, with an average of 70°·3. The highest temperature recorded was 100°·6, and the lowest 49°·6. The greatest rainfall occurs in October and June; the yearly average for thirty years was 51·73 inches, but the amount varies considerably in different years. The greatest annual fall was 71·40 inches, and the smallest 40·59 inches. Thunderstorms are of almost daily occurrence in the West Indies, but little damage results from them. Meteorological observations have been made for many years at Manila Observatory. From tables compiled by Prof. Hazen it appears that the average annual temperature is 80°. The hottest month is May, with an average of 84°, and December and January are the coolest months, each with an average of 77°. The highest temperature recorded was 100°, and the lowest 74°. The mean annual rainfall is 75·43 inches, of which more than 80 per cent. falls between June and October. Departures from the average are in some instances remarkable, the extremes varying from 121 to 35·6 inches, while the fall of 61 inches in one September, and only 2 inches in another September is still more remarkable.

Prof. Klein, of Göttingen, contributes to the *Nachrichten der K. Gesellschaft der Wissenschaften in Göttingen* a statement of the arrangements that have been made to complete the publication of Gauss's works, consequent on the death of Prof. Ernst Schering, who up till lately has undertaken the work. The remaining unpublished papers on Astronomy are to be edited by Prof. Brendel; those dealing with Theory of Numbers and analysis are taken over by Prof. Fricke, of Brunswick; for Gauss's geometrical investigations Prof. Stäckel, of Kiel, has been secured; Profs. Börsch and Krüger, of the Geodetic Central Institute in Potsdam, have promised their assistance for papers on geodesy; and Prof. Wiechert, recently appointed Director of the Gauss Magnetic Observatory, is to deal with Gauss's papers on mathematical physics. It is proposed to issue three further volumes and a supplementary index-volume; vol. vii. will be devoted exclusively to astronomy; vol. viii. will consist of matter supplementary to previous volumes, especially theory of numbers, analysis, geometry and geodesy; and vol. ix. will be reserved for biographical matter.

A detailed report on the growth of sugar-beet, and the manufacture of sugar in the United Kingdom, is contributed by Sir J. B. Lawes and Sir Henry Gilbert to the *Journal* of the Royal Agricultural Society. Reviewing the whole of the facts that are adduced in the paper, both as to the climate and other conditions essential for the production of sugar-beet in sufficient quantity, and of sufficient quality, the authors are disposed to think that, so far as the production of the roots is concerned, it could only be a success over comparatively limited areas, and not throughout the agricultural districts of Great Britain generally. As to the profits of the sugar factories, if established, the cost of roots of good quality would probably be so high as to make it doubtful whether, with the present price of sugar in the market, adequate profits from the manufacture could be expected. In conclusion the authors think that if the sugar-beet industry is to be established with any prospect of success, great caution should be exercised in the choice of the locality or localities, and that the undertakings should, in the first instance, be limited in number and confined to the most suitable localities.

The latest issue of the *Izvestia* of the Russian Geographical Society (1897, iv.) contains a valuable paper, by Prof. Mushketoff, on the glaciers of Russia in 1896. The plan of the Russian Geographical Society is to obtain every year, if possible, accurate measurements of the state of a number of glaciers, especially in the Caucasus, so as to know with accuracy whether they increase in bulk, or decrease, and to which extent. For eight glaciers the measurements extend already for the past eight to ten years, and they show that these glaciers have been steadily decreasing, their lower ends having retreated at an average speed of from 9 to 38 metres every year. Taking the northern and the southern slope of the Caucasus separately, the average speeds of retreat are 22 metres a year for the former, and 25 metres for the latter. Several new glaciers were discovered in 1896 by the botanists Bush and Schukin. In Turkestan, the expedition of Lipskiy and Barschevskiy discovered in the Hissar Range a great number of large glaciers, formerly unsuspected, the biggest ones lying at the headwaters of the Yagnob River. Their lower ends descend to altitudes of from 10,500 to 11,000 feet, and their *névés* lie at altitudes of 13,000 feet and more. They are all much smaller now than they have been formerly, as may be seen from the moraines and débris with which they are surrounded. Photographs of the Zerafshan glacier, which were procured in 1896 by Maslovskiy, show that it has considerably decreased since 1881. In Siberia, a number of formerly insufficiently-known glaciers was described by Prof. Sapozhnikoff; the main ones, much greater than the well-known Berel, belong to the system of the Byelukha mountain—the Katuñ glacier consisting of two branches, $3\frac{1}{2}$ and $4\frac{3}{4}$ miles long. The Altai glaciers reach by their lower ends the 6600-feet level. Three big ones were discovered at the headings of the Bukhtarma, and one in the Kimas Range of the South Altai. All are much smaller now than they were formerly.

THE Fauna of the Neocomian Belemnite Beds of Baluchistan is described (in the "Palæontologia Indica") by Dr. Fritz Noetling. Two plates suffice to illustrate the species, which include only *Gryphæa Oldhami* (n.sp.), and four well-known Neocomian Belemnites. A further contribution to the Palæontology of Baluchistan, by Dr. Noetling, is entitled "Fauna of the Upper Cretaceous (Maëstrichtien) Beds of the Mari Hills." As remarked by the author, the species described are of special interest, inasmuch as they shed quite a new light on the geographical distribution of the Upper Cretaceous fauna Seventy-seven fossil forms have been obtained at present from the strata, and of these sixty-six have been described specifically—of the others only the genus could be determined. Twenty-three plates are devoted to their illustration. No less than twenty-four of the species have been identified with forms previously described, and these naturally are the more interesting. They include *Hemipneustes* (two sp.), *Ostrea acutirostris*, *Gryphea vesicularis*, *Pecten* (*Vola*) *quadricostata*, *Corbula harpa*, *Nautilus sublævigatus*, &c. The author concludes that the strata ("Hemipneustes beds") are of Upper Senonian age, and most probably represent the "Étage Maestrichtien." The fauna bears hardly any resemblance to that of similar age in southern India or northern Africa; it belongs rather to the European province of the Upper Cretaceous sea. This sea was most probably divided by a comparatively narrow land-barrier from the sea in which lived the Upper Cretaceous fauna of southern India, a view first expressed by Dr. W. T. Blanford.

THE Cephalopoda of the Lower Trias of the Himalayas are described by Dr. Carl Diener in a recent memoir of the Geological Survey of India ("Palæontologia Indica"). The fossils figured, in twenty-three plates, as in the above-mentioned monograph, are mostly Ammonites, together with a few species of Nautilus, and one Orthoceras. Among the forms described are *Prosphingites nala*, *Hedenstroemia Mojsisovici*, *Nannites hindostanus*, *Xenaspis* (*Vishnuites*) *Pralambha*, *Ophiceras Sakuntala*, *Koninckites Yudishthira*, *Kingites Varaha*, and *Lecanites sisupala*. The work bears evidence of great care, minute study, and research; but it seems a pity that generic or sub-generic names coined on a more uniform system should not be adopted, even for the sake of the palæontologist who confines his attention to the Order of "Ammonea," to which all the before-mentioned forms belong. Dr. Diener also describes the Permian fossils of the *Productus*-shales of Kumaon and Gurhwal. These shales are intimately connected with the lowest Triassic deposits in the Niti area of the Himalayas, and they rest on an eroded surface of Upper Carboniferous rocks; nevertheless, they contain species of *Productus* of late Carboniferous or Permian type. The fossils are figured in five plates, and they include the well-known European form *Athyris Royssii*.

THE Gasteropoda of the Trias of Halstatt form the subject of a well-illustrated and important monograph by Dr. E. Koken (*Abhandl. der K.K. geol. reichanstalt*, Band xvii., Wien). Twenty-three plates are devoted to the illustration of the fossils, and they include species of *Pleurotomaria*, *Murchisonia*, *Trochus*, *Natica*, *Chemnitzia*, and other genera; and multitudes of sub-genera (as most geologists would prefer to regard them), but the names of these, which are legion, can only be appreciated by the specialist.

RECENT researches on metallic lithium have shown that this metal cannot be distilled in either hydrogen or nitrogen gases, vigorous combination occurring in both cases. The metals of the alkaline earths would appear to behave similarly; so that if it should be necessary to heat these substances in an indifferent gas, argon or helium must be employed. In the current number of the *Comptes rendus*, M. Moissan shows that if pure calcium be heated in hydrogen, the metal takes fire and burns energetically, forming the hydride CaH_2, a transparent crystalline substance which is stable at a high temperature. It behaves as a strong reducing agent, and is violently decomposed by cold water, giving off one-seventh of its weight of pure hydrogen gas. It differs from the corresponding lithium hydride in that nitrogen is without action upon it at a red heat.

THE Cambridge University Press announce a series of monographs upon material obtained by Dr. Arthur Willey, Balfour Student of the University of Cambridge, from New Britain, the Loyalty Islands, and other islands of the South Pacific during the years 1895–97. The work, which will be illustrated, will embody the zoological results of the expedition, and will, it is expected, be completed in five or six parts. The first part (to be published in August) will contain the following contributions: (1) On the anatomy and development of *Peripatus novæ-brittanniæ*, by Dr. Arthur Willey; (2) on a little-known sea-snake from the South Pacific, by G. A. Boulenger; (3) account of the Phasmidæ with notes on the eggs, by D. Sharp; (4) *Metaprotella sandalensis*, n. sp., by Dr. Paul Mayer; (5) report on the Millipedes and Centipedes, by R. I. Pocock; (6) report on the Arachnida, by R. I. Pocock.

THE series of "Museum Hand-books" issued by the Manchester Museum has been added to by a paper on "The Nomenclature of the Seams of the Lancashire Lower Coal Measures," which was read before the Manchester Geological Society in January last by Mr. Herbert Bolton. Many students will doubtless be glad to have the paper in its present handy form.

FROM time to time we have noticed papers, chiefly of local interest, dealing with the Hereford earthquake of December 17, 1896. We understand that Dr. Davison's detailed report will shortly be published by Messrs. Cornish Bros., Birmingham, provided that a sufficient number of subscriptions be obtained to defray the cost of printing.

WE have received from Messrs. H. W. Cox, Ltd., their price list of induction coils and apparatus for producing X-rays. In it is to be found full particulars as to the prices and capabilities of the specialities of this firm.

THE current number of the *Journal* of the Society of Arts contains the first of the series of Cantor lectures, by Prof. Noel Hartley, F.R.S., on "The Thermo-Chemistry of the Bessemer Process."

THE additions to the Zoological Society's Gardens during the past week include two Vervet Monkeys (*Cercopithecus lalandii*) from Natal, presented by Mr. W. Champion; a Great Wallaroo (*Macropus robustus*) from South Australia, presented by Miss W. Jackson; two —— Hedgehogs (*Erinaceus*, sp. inc.) from North Africa, presented by Sir Harry Johnston, K.C.B.; a European Pond Tortoise (*Emys orbicularia*), European, presented by Mr. A. H. Cocks; an Algerian Tortoise (*Testudo ibera*) from Algeria, presented by Mr. G. H. Gude; a Sulphurous Snake (*Phrynonax sulphureus*), a Deadly Snake (*Lachesis atrox*), a Centipede from Trinidad, presented by Mr. R. R. Mole; a Lataste's Viper (*Vipera latasti*) from Algeria, presented by Mr. Carl Hagenbeck; two Yellowish Finches (*Sycalis luteola*) from Brazil, presented by Mr. F. L'hoest; an Arabian Baboon (*Cynocephalus hamadryas*) from North Africa, a Grey Parrot (*Psittacus erithacus*) from West Africa, a Swainson's Lorikeet (*Trichoglossus novæ-hollandiæ*), two Pennant's Parrakeets (*Platycercus elegans*) from Australia, a Thick-necked Tree Boa (*Epicrates cenchris*), a Corais Snake (*Coluber corais*) from Trinidad, deposited; a Giraffe (*Giraffa camelopardalis*, ♂) from Senegal, eight Lateral White-eyes (*Zosterops lateralis*) from New Zealand, two Indian Tantalus (*Pseudotantalus leucocephalus*) from India, two Spotted Pigeons (*Columba maculosa*), a Burmeister's Cariama (*Chunga burmeisteri*) from Argentina, four Wandering Tree Ducks (*Dendrocygna arcuata*) from the East Indies, purchased; a Puma (*Felis concolor*), two Barbary Wild Sheep (*Ovis tragelaphus*), a Burrhel Wild Sheep (*Ovis burrhel*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMETARY NEWS.—In the *Astronomische Nachrichten* (Nos. 3501 and 3504) we find the ephemeris for both of Perrine's comets, namely March 19 and June 14. The former, which is situated in the northern part of Auriga and is visible for the greater part of the night, is gradually receding from the earth and becoming faint. Its ephemeris for the present week is:—

12h. Paris M.T.

1898.	R.A. h. m. s.	Decl. ° ′ ″	Br.
July 16	5 28 46	+53 48 47	
17	30 46	44 17	0·08
18	32 44	39 48	
19	34 40	35 21	
20	36 33	30 55	
21	5 38 25	+53 26 32	0·08

Perrine's comet, discovered on June 14, is, however, rapidly increasing in brightness and is getting near the sun, rendering observation somewhat difficult towards the end of this month. Its ephemeris for the week, as calculated by Dr. Berberich, is—

12h. Berlin M.T.

1898.	R.A. (app.) h. m. s.	Decl. (app.) °	Br.
July 14	6 8 45	+44 38·7	2·98
15	13 7	43 52·7	
16	17 25	43 5 6	
17	21 40	42 17·3	3·36
18	25 52	41 27·8	
19	30 0	40 37·1	
20	34 5	39 45·4	
21	6 38 7	+38 52·3	3·96

Wolf's comet, which is situated in Taurus, is gradually increasing in brightness and moving eastwards. This body will approach Mars very closely on July 19, their positions differing in R.A. and Declination by only 1·9m. and 0 0 respectively, as computed by Herr Thræn. Its ephemeris is as follows:—

1898.	R.A. h. m. s.	Decl. ° ′	Br.
July 14	3 38 1	19 51·8	2·2
15	40 56	48·5	
16	43 50	44·8	
17	46 44	40·9	2·2
18	49 37	36·6	
19	52 31	32·1	
20	55 23	27·5	
21	3 58 15	+19 22·7	2·3

Comet Giacobini, though moving rapidly northwards as regards declination, is becoming now a faint object, being one-half the brightness it was at the time of its discovery.

STARS HAVING PECULIAR SPECTRA.—In a recent *Harvard College Circular* (No. 32) Prof. Pickering publishes a list of stars the spectra of which are described as peculiar. Most of these have great southern declinations, so we give below a short list of the few that can be observed in these latitudes. The stars were all discovered by Mrs. Fleming in her regular examination of the Draper Memorial photographs.

Designation. °	R.A. 1900. h. m.	Dec. 1900. ° ′	Magn.	Description.
−12 1500	6 23·7	−12 59	7·7	Type I. Hβ bright.
+ 5 1267	6 25·2	+ 5 57	7·1	" " "
− 8 1467	6 28·1	− 8 48	8·5	Peculiar. Variable with small range.
+ 6 1309	6 32·0	+ 6 14	6·5	Type I. Hβ bright.
" "	7 13·9	−13 3	"	Type V. Gal. long. 195° 30′, lat. + 1° 11′.
−11 1941	7 22·4	−11 31	8·9	Peculiar. Variable.
− 4 3199	11 59·6	− 5 13	8·7	Type II. Variable.
− 8 5858	22 16·5	− 8 7	8·5	Type III. Hyd. lines bright? Variable.

Two other stars with great southerly declinations, A.G.C. 14145 and 14686, show spectra with bright and dark hydrogen lines. In the former Hβ and Hγ are variable. On June 2, 1893, they were bright and superposed on a broad dark band. On April 17, 1895, and March 17, 1896, these lines, like the other hydrogen lines, were dark. In the latter star the hydrogen lines were also variable. On May 20, 1892, Hβ, Hγ and Hδ were dark. On April 3, 1895, Hβ was bright, and on April 21, 1895, Hβ and Hγ were bright. Hζ and Hη were dark with the edge of greater wave-length apparently bright.

A careful study of the spectra of some of the bright southern stars has enabled Miss Cannon to increase the number of stars containing the additional hydrogen lines first seen in ζ Puppis. Thus in A.G.C. 17572, 3925, 4027, 4202 and 4544 are present and dark. In A.G.C. 8631 and 22763 the lines 4027, 4202 and 4544, and the bands 4633 and 4688 are present and bright. In the stars A.G.C. 10863, 22748 and 22843, the hydrogen lines 3925, 4027, 4202 and 4544 are present and dark, and the bands 4633 and 4688 are bright. In the last two mentioned stars, and also in A.G.C. 9311, 26 Canis Majoris, the band 4633 is described as being double.

THE CONSTANT OF ABERRATION AND STELLAR MAGNITUDES.—In determining the constant of aberration by stars of different magnitudes, using the well-known method of Talcott, Prof. Doberck finds (*Astr. Nachr.*, 3504) that the values decrease as the magnitudes decrease. Thus, using stars averaging 4·4 in magnitude, the value of the constant he obtained was 20″·639 ± 0″·075, with stars averaging 5·4 it was 20″·430 ± 0″·063, and with those of 6·4 magnitude the value was 20″·385 ± 0″·066. Prof. Doberck suggests that perhaps this fact may explain differences in the values obtained at different observatories, such differences being always in excess of their probable errors.

THE ECLIPSED AND UN-ECLIPSED SUN.—In the *Bulletin de la Société Astronomique de France* (for July), M. Deslandres gives an account of the methods he adopts in photographing the entire chromosphere of the sun. As this beautiful method has been previously published, we need only draw attention to the very fine phototypes which illustrate the magnificent results that he has so successfully obtained. *Knowledge* for the same month contains two reproductions from Prof. Campbell's negatives of the solar corona obtained in India this year.